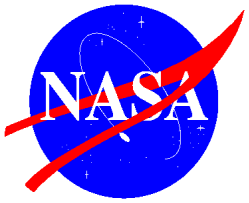

George C. Marshall Space Flight Center
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ED27-SHK-FOP-001
BASELINE
8/3/99

ED27 / VIBRATION, ACOUSTICS, AND SHOCK TEAM

FACILITY OPERATING PROCEDURE

MAC/RAN AND MACSET SOFTWARE VERIFICATION

CHECK THE MASTER LIST—
VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE

Document History Log

Status (Baseline / Revision / Canceled)	Document Revision	Document Date	Description
Baseline		8/3/99	Document converted from ED73-SHK-FOP-001 Baseline. Organizational and document number changes.

1. INTRODUCTION

1.1 Scope. This procedure defines the software verification used to verify some test software used in pyrotechnic shock testing.

1.2 Purpose. This procedure defines the system to fulfill the requirements of MPG 8730.5.

1.3 Applicability. This procedure applies to MAC/RAN and MACSET software used in the pyrotechnic shock facility and related test activities.

2. DOCUMENTS

2.1 Applicable Documents

ED27-OWI-M&V-002 Quality Records Control

2.2 Reference Documents

MPG 8730.5 Control of Inspection, Measuring, and Test Equipment

3. SOFTWARE LIMITATIONS

Record software limitations in appendix B.

4. INSTRUCTIONS

The input files used for this verification are simulated sine wave time files. The files are arranged and analyzed in 6 test runs using the MACSET setup and plotting program and MAC/RAN analysis program. Any out-of-tolerances recorded during this verification will be reconciled and the procedure will be redone before the software is used for in-scope testing.

4.1 MACSET Setup. At the DOS prompt, run the MS batch file to start MACSET. Set the following parameters and save the setup files using MACSET for filenames MVDT01, MVDT02, MVDT03, MVDT04,MVDT05, and MVDT06.

Number of .SDF's: 9 Numbered Sequentially? Y
Job Header: MAC/RAN & MACSET Software Verification
Starting Freq.: 50 Ending Freq.: 10000
Octave Spacing: 06
Plot Option: 3

4.2 At the DOS prompt, run the following batch files to analyze each test run: MVDT01, MVDT02, MVDT03, MVDT04, MVDT05, and MVDT06. Plot the results between each run using the following plotting parameters for MACSET.

Plot Overlays: N
Number of Plots: 9 Numbered Sequentially? Y
Spec. & Tolerance: 0
Send Plot to: P
Plot: 2

4.3 The maximum absolute value of the transient capture plot amplitude (g's) should be as listed in Appendix A, +/- 0.5% and recorded in appendix B. The SRS plot maximum at the specified frequency should be 10 times the peak transient capture amplitude, +/- 0.5% and recorded in appendix B.[2]

5. NOTES

[1] ABCTXXY.SDF is the filename convention used for matching files between MAC/RAN and MACSET and is as follows:

ABC - is the 3 letter test designator (i.e. TPS, SRB, etc.)
T - is used to divide the filename
XX - is the test number from 01 to 99
Y - is the accelerometer or data channel number from 1 to 9
.SDF - is the filename designation for files in the MAC/RAN Standard Data Format
.IFO - is the filename designation for MACSET information files.
.SCF - is the filename designation for files in the MAC/RAN Standard Control Format
.TXT - is the filename designation for MACSET data plot files.
.BAT - is the filename designation for the batch file that starts the analysis

[2] If the SRS maximum does not fall between the min./max. values listed in appendix B, the tolerances for the actual maximum absolute value of the transient capture plot amplitude may be calculated and noted in appendix B.

[3] The input data files were generated using the MAC/RAN Plug module. The number of points was calculated for 20 sine waves using the formula:
No. of points = ((1/freq.)*(No. of sine waves))*(sampling rate)

6. QUALITY RECORDS

6.1 Calibration Record. The data files listed in appendix A will be kept on the computers hard drive and on a 3.5" floppy disk labeled "MAC/RAN & MACSET Software Verification Data Files". The floppy disk, the information in appendix B, and the data plots will be filed as a calibration record per ED27-OWI-M&V-002.

APPENDIX A

MAC/RAN & MACSET Software Verification Data Files[3]

Filename	Plot ID	Freq. (Hz.)	g's	# of points	pts./sec.
MVDT011.SDF	T01 A1	50	100	20,000	50,000
MVDT012.SDF	T01 A2	56.123	100	17,818	50,000
MVDT013.SDF	T01 A3	62.996	100	15,874	50,000
MVDT014.SDF	T01 A4	70.711	100	14,142	50,000
MVDT015.SDF	T01 A5	79.37	100	12,599	50,000
MVDT016.SDF	T01 A6	89.09	100	11,225	50,000
MVDT017.SDF	T01 A7	100	100	10,000	50,000
MVDT018.SDF	T01 A8	112.25	100	8,909	50,000
MVDT019.SDF	T01 A9	125.99	100	7,937	50,000
MVDT021.SDF	T02 A1	141.42	100	7,071	50,000
MVDT022.SDF	T02 A2	158.74	100	6,300	50,000
MVDT023.SDF	T02 A3	178.18	100	5,612	50,000
MVDT024.SDF	T02 A4	200	100	5,000	50,000
MVDT025.SDF	T02 A5	224.49	100	4,455	50,000
MVDT026.SDF	T02 A6	251.98	100	3,969	50,000
MVDT027.SDF	T02 A7	282.84	100	3,536	50,000
MVDT028.SDF	T02 A8	317.48	100	3,150	50,000
MVDT029.SDF	T02 A9	356.36	100	2,806	50,000
MVDT031.SDF	T03 A1	400	100	2,500	50,000
MVDT032.SDF	T03 A2	448.98	100	2,227	50,000
MVDT033.SDF	T03 A3	503.97	100	1,984	50,000
MVDT034.SDF	T03 A4	565.69	100	1,768	50,000
MVDT035.SDF	T03 A5	634.96	100	1,575	50,000
MVDT036.SDF	T03 A6	712.72	100	1,403	50,000
MVDT037.SDF	T03 A7	800	100	1,250	50,000
MVDT038.SDF	T03 A8	897.97	100	1,114	50,000
MVDT039.SDF	T03 A9	1007.9	100	992	50,000
MVDT041.SDF	T04 A1	1131.4	1	884	50,000
MVDT042.SDF	T04 A2	1269.9	50	787	50,000
MVDT043.SDF	T04 A3	1425.4	51	702	50,000
MVDT044.SDF	T04 A4	1600	100	625	50,000
MVDT045.SDF	T04 A5	1795.9	101	557	50,000
MVDT046.SDF	T04 A6	2015.9	250	992	100,000
MVDT047.SDF	T04 A7	2262.7	251	884	100,000
MVDT048.SDF	T04 A8	2539.8	500	787	100,000
MVDT049.SDF	T04 A9	2850.9	501	702	100,000
MVDT051.SDF	T05 A1	3200	1000	625	100,000
MVDT052.SDF	T05 A2	3591.9	1001	557	100,000
MVDT053.SDF	T05 A3	4031.7	2500	496	100,000
MVDT054.SDF	T05 A4	4525.5	2501	442	100,000
MVDT055.SDF	T05 A5	5079.7	5000	591	150,000
MVDT056.SDF	T05 A6	5701.8	5001	526	150,000
MVDT057.SDF	T05 A7	6400	9975	469	150,000
MVDT058.SDF	T05 A8	7183.8	1000	418	150,000
MVDT059.SDF	T05 A9	8063.5	1000	372	150,000
MVDT061.SDF	T06 A1	9051	1000	442	200,000
MVDT062.SDF	T06 A2	10,159	1000	394	200,000

APPENDIX B

MAC/RAN & MACSET Software Verification

MAC/RAN software being verified: _____ Ver. _____

MACSET software being verified: _____ Ver. _____

Computer system where MAC/RAN & MACSET software is being used:
Brand & Model: _____ ECN: _____

	Transient Capture				SRS			Transient Capture				SRS	
Plot ID	Min.	Act.	Max.	Min.	Act.	Max.	Plot ID	Min.	Act.	Max.	Min.	Act.	Max.
T01 A1	95		105	950		1050	T03 A7	95		105	950		1050
T01 A2	95		105	950		1050	T03 A8	95		105	950		1050
T01 A3	95		105	950		1050	T03 A9	95		105	950		1050
T01 A4	95		105	950		1050	T04 A1	1		1	9.5		10.5
T01 A5	95		105	950		1050	T04 A2	47		52	475		525
T01 A6	95		105	950		1050	T04 A3	48		54	484		535
T01 A7	95		105	950		1050	T04 A4	95		105	950		1050
T01 A8	95		105	950		1050	T04 A5	96		106	959		1060
T01 A9	95		105	950		1050	T04 A6	237		262	2375		2625
T02 A1	95		105	950		1050	T04 A7	238		263	2385		2635
T02 A2	95		105	950		1050	T04 A8	475		525	4750		5250
T02 A3	95		105	950		1050	T04 A9	476		526	4759		5260
T02 A4	95		105	950		1050	T05 A1	950		1050	9500		10500
T02 A5	95		105	950		1050	T05 A2	951		1051	9501		10510
T02 A6	95		105	950		1050	T05 A3	2375		2625	23750		26250
T02 A7	95		105	950		1050	T05 A4	2376		2626	23759		26260
T02 A8	95		105	950		1050	T05 A5	4750		5250	47500		52500
T02 A9	95		105	950		1050	T05 A6	4751		5251	47501		52510
T03 A1	95		105	950		1050	T05 A7	9476		10474	94762		104737
T03 A2	95		105	950		1050	T05 A8	950		1050	9500		10500
T03 A3	95		105	950		1050	T05 A9	950		1050	9500		10500
T03 A4	95		105	950		1050	T06 A1	950		1050	9500		10500
T03 A5	95		105	950		1050	T06 A2	950		1050	9500		10500
T03 A6	95		105	950		1050							

Software Limitations:
MACSET: The number of .SDF files that can be analyzed per test number[1]: _____
The maximum transient capture amplitude for plots: _____
The maximum SRS amplitude for plots: _____
The MAX./MIN. values on the transient capture plots: _____

Verification performed by: _____ Date: _____